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DEVELOPMENT OF THE GYPSUM INDUSTRY BY STATES

BY

R. M. SANTMYERS

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October, 1929.

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DEPARTMENT OF COMMERCE - BUREAU OF MINES

DEVELOPMENT OF THE DOMESTIC GYPSUM INDUSTRY, BY STATES 1/

By R. M. Santmyers 2/

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INTRODUCTION

During the last decade the consumption of gypsum has increased rapidly in the United States, but the ability of American and Canadian mines to produce has increased even faster. The industry has been active in research leading toward enlarging the field of its products and in educating architects, builders and the general public with regard to the desirable features of gypsum materials. These efforts have been successful and promise to be even more so. Another stabilizing factor within the industry is the tendency of manufacturers to diversify their products. A manufacturer who has a complete line of specialties to fall back upon during an off season or a depression in the construction industry is better able to keep his plant well occupied throughout the year. During very recent years a number of new gypsum product specialties have been brought forth, many of which are closely identified with the individual manufacturer producing them--an excellent safeguard which appears to have a profitable future.

In the past year or so several manufacturers have put forth building plans or begun actual construction of gypsum plants at strategic points, especially along the Atlantic seaboard and bordering the Great Lakes; a few of these plants are already in operation. The location of plants at such points will have a tendency further to acquaint the metropolitan areas with the merits of gypsum products - especially those pertaining to building construction - and should enable the market to be thoroughly covered at less cost than formerly when sales efforts were directed from plants situated several hundred miles away from points of delivery.

The tendency within the industry to-day seems to be for concentration in the more thickly populated areas, and for consolidations involving two or mor of the smaller producing companies.

The following table shows the production and sale of gypsum in the United States from 1890 to 1927.

PRODUCTION

A study of the statistical record of production of crude gypsum will furnish an idea of the rapid increase in the use of this mineral.

At the beginning of the last decade of the 19th century (1890), the total production of crude gypsum mined in the United States had reached the then exceptionally large figure of 182,995 short tons, valued at $574,523 or an average of $3.14 per ton. Since that year, the industry has shown a generally steady increase, with the exception of the war years, to a maximum in 1925. Even during 1917 and 1918 the decrease was not as great as in some other basic industries, due to the continued demand for fireproofing materials usable in rapid construction, as in factory and munitions buildings, cantonments, etc. It was during this period that the use of gypsum roofing slabs, precast or cast on the job, partition tiles, and plaster board came into prominence as building materials; ease and rapidity of construction, relative cheapness of materials, and unusual fireproof qualities played the major part in increasing the demand for these products.

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Year	Total quantity	Quantity, short tons	Value	Price per ton	Quantity, short tons	Value	Price per ton	Quantity, short tons	Value	Price per ton	Total value of sales	Percentage sold as crude
1890	182,995	18,742	$ 19,148	$1.02	56,525	$143,014	$2.53	79,257	$ 412,361	$5.20	$ 574,523	10
1891	208,126	18,574	28,690	1.54	51,700	117,356	2.27	110,006	482,005	4.38	628,051	9
1892	256,259	58,080	80,797	1.39	47,668	106,247	2.23	106,141	508,448	4.79	695,492	23
1893	253,615	42,808	71,860	1.68	50,408	106,365	2.11	122,937	518,390	4.22	696,615	17
1894	239,312	34,702	56,149	1.62	41,996	95,944	2.28	127,158	609,626	4.79	761,719	15
1895	265,503	26,624	37,837	1.42	35,079	85,355	2.43	150,801	674,255	4.47	797,447	10
1896	224,254	17,302	19,134	1.11	27,354	59,749	2.18	137,505	494,461	3.60	573,344	8
1897	288,982	23,164	27,020	1.17	31,562	67,083	2.13	180,935	661,761	3.66	755,864	8
1898	291,638	5,758	7,200	1.25	40,929	90,777	2.22	190,083	657,303	3.46	755,280	2
1899	486,235	58,352	66,762	1.14	50,033	100,797	2.01	286,227	1,119,521	3.91	1,287,080	12
1900	594,462	35,479	44,127	1.24	45,682	82,806	1.81	396,284	1,500,270	3.79	1,627,203	6
1901	633,791	68,669	71,773	1.05	59,058	109,551	1.85	399,686	1,325,317	3.31	1,506,641	11
1902	816,478	81,455	93,914	1.15	60,791	106,237	1.75	539,387	1,889,190	3.50	2,089,341	10
1903	1,041,704	73,912	87,608	1.19	74,601	154,945	2.08	742,543	3,550,390	4.78	3,792,943	7
1904	940,917	56,137	61,234	1.09	70,167	142,490	2.03	665,340	2,580,601	3.88	2,784,325	6
1905	1,043,202	67,105	106,041	1.58	40,196	74,280	1.85	736,708	2,848,906	3.87	3,029,227	6
1906	1,540,585	186,999	460,545	2.46	62,671	157,292	2.50	899,581	3,220,138	3.58	3,837,975	12
1907	1,751,748	232,546	424,227	1.82	46,851	115,841	2.47	1,125,301	4,402,196	3.91	4,942,264	13
1908	1,721,829	209,031	334,009	1.60	37,672	91,623	2.43	1,125,617	3,650,192	3.24	4,075,824	12
1909	2,252,785	292,274	448,814	1.54	49,581	103,695	2.09	1,514,037	5,354,229	3.54	5,906,738	13
1910	2,379,057	368,014	559,172	1.52	53,815	110,325	2.05	1,583,669	5,853,532	3.70	6,523,029	15
1911	2,323,970	334,600	491,906	1.47	52,880	97,573	1.85	1,598,418	5,872,556	3.67	6,462,035	14
1912	2,500,757	388,543	516,464	1.33	53,065	107,058	2.02	1,731,674	5,940,386	3.43	6,563,908	16
1913	2,599,508	408,321	601,113	1.47	54,815	95,953	1.75	1,773,849	6,077,756	3.43	6,774,822	16
1914	2,476,465	390,742	549,083	1.41	52,945	97,716	1.85	1,656,066	6,249,190	3.77	6,895,989	16
1915	2,447,611	406,393	528,161	1.30	69,256	122,714	1.77	1,613,720	5,946,018	3.68	6,596,893	17
1916	2,757,730	465,240	623,294	1.34	81,879	167,136	2.04	1,805,814	7,168,602	3.97	7,959,032	17
1917	2,696,226	539,627	893,562	1.66	84,366	230,808	2.74	1,677,390	9,992,082	5.96	11,116,452	20
1918	2,057,015	405,621	980,836	2.42	64,571	255,716	3.96	1,328,269	10,234,302	7.70	11,470,854	20
1919	2,420,163	470,267	1,332,637	2.83	39,978	185,566	4.64	1,596,020	14,209,704	8.90	15,727,907	19
1920	3,129,142	561,817	2,007,270	3.57	107,443	557,925	5.19	1,904,484	21,967,870	11.53	24,533,065	18
1921	2,890,784	537,978	1,775,109	3.30	104,966	490,902	4.68	1,796,851	21,434,279	11.93	23,700,290	19
1922	3,779,949	668,821	2,056,143	3.07	101,904	387,203	3.80	2,491,265	26,917,805	10.80	29,361,151	18
1923	4,753,448	821,816	2,427,410	2.95	25,426	150,026	5.90	3,101,378	32,310,719	10.42	34,888,155	17
1924	5,042,629	959,810	2,548,708	2.66	22,298	125,612	5.63	3,568,569	40,050,187	11.22	42,724,507	19
1925	5,678,302	988,134	2,669,327	2.70	26,001	153,902	5.92	4,096,357	44,754,011	10.93	47,577,240	17
1926	5,635,441	934,069	2,357,969	2.52	27,294	151,916	5.57	4,015,974	44,211,334	11.01	46,721,219	17
1927	5,346,888	935,919	2,258,838	2.41	29,452	129,825	4.41	3,912,211	39,785,791	10.17	42,174,454	18

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The sales of crude gypsum have been increasing proportionately with production of the crude rock. Because of the great increase in manufacture of Portland cement the industry consumes larger quantities of crude gypsum as a retarder to-day than ever before, requiring 969,357 short tons of the total of 999,412 tons of crude gypsum used for all purposes in 1928. The use of ground crude gypsum as agricultural fertilizer or land plaster, however, has been showing a steady decrease during the past decade.

The greatest use for gypsum is in the production of calcined gypsum, from which practically all of the manufactured products are made. This use has increased from 79,257 tons, valued at $412,361 in 1890, to 3,641,385 short tons, valued at $30,134,129 in 1928. (In 1925, the peak year, 4,096,357 tons were used valued at $44,754,011.)

The following table shows the production of gypsum in the United States, by States, for the years 1890 to 1927.

GYPSUM INDUSTRY BY STATES

While gypsum is found in practically all sections of the United States, only certain States are exploiting their deposits. In some States the deposits are small or low grade, while in others, though the gypsum may be suitable for economical mining, the market requirements are not large enough to warrant the erection of plants for the manufacture of gypsum products.

New York, Iowa, Michigan, Ohio, Texas, and Nevada in the order named are the largest producers.

Alaska

The production of gypsum in Alaska began about 1906, when the Pacific Coast Gypsum Co. began working the only known extensive deposit in southeastern Alaska. 3/ This deposit is situated in the eastern part of Chichagof Island, about a mile from Iyouheen Cove. The gypsum beds apparently overlie the Carboniferous rocks which are exposed along the southeastern shore of the cove. Gypsum also occurs in the bottom of the valley, but as the valley is deeply filled with gravel the limits of the gypsum have not been ascertained. The main body of gypsum is of high purity.

The mine shaft is 315 feet deep, with levels at 75, 160, and 300 feet from the surface. For 11 years the company mined on the second level, working over an extensive area. In 1917 mining was done on the 300-foot level. From the mine bins (1200 and 2500 tons capacity) the gypsum was taken by tram cars to the wharf and dumped into a 2000-ton bin. Shipments of crude gypsum were made by barges to Tacoma, Wash., where the manufacturing plant was situated. It was calcined and manufactured into various grades of wall plaster, plaster board, and plaster blocks.

Other claims located on reported deposits of gypsum adjoining on the east extend to the shore of Chatham Strait.

3/ Stone, R. W., Gypsum. Mineral Resources of the United States, U. S. Geol. Survey, part 2, 1913, p.363.

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Year	Iowa	Kansas	Michigan	Nevada	New York	Ohio	Okla.	Tex.	Utah	Va.	Other States	Total mined	Value of sales
1890	20,900	20,250	74,877		32,903	12,748				6,350	14,967	182,995	$ 574,523
1891	31,385	40,217	79,700		30,135	9,123			3,000	5,959	13,327	212,846	647,451
1892	12,000	46,016	139,557		32,394	13,275		1,926	2,600	6,991	1,500	256,259	695,492
1893	21,447	43,631	124,590		36,126	11,646		4,011		7,014	5,150	253,615	696,615
1894	17,906	64,889	79,958		31,798	20,827	1,300	6,925	1,920	8,106	5,683	239,312	761,719
1895	25,700	72,947	66,519		33,587	21,662	13,100	10,750	2,134	5,800	13,304	265,503	807,447
1896	18,631	49,435	67,634		23,325	22,634	8,000	16,022	2,866	5,955	9,752	224,254	573,344
1897	29,430	54,353	94,874		33,440	18,592	10,734	24,454	2,700	6,374	14,031	288,982	755,864
1898	24,733	59,180	93,181		31,655	21,303	3,150	34,215	2,610	8,378	13,233	291,638	755,280
1899	75,574	85,046	144,776		52,149	27,205	23,526	53,773	2,352	11,480	10,354	486,235	1,287,080
1900	184,600	48,636	129,654	1,000	58,890	39,034	24,937	80,622	2,397	11,940	12,752	594,462	1,627,203
1901	213,419	(1)	185,150		119,565		15,930	(1)		15,236	84,491	633,791	1,506,641
1902	295,769	(1)	240,227		110,364	101,545	34,156	(1)		(2)	34,417	816,478	2,089,341
1903	307,102	(1)	269,093		137,886	103,392	69,158	(1)		(2)	155,073	1,041,704	3,792,943
1904	145,359	173,721	238,385		158,892	101,809	53,523	(3)		(2)	69,228	940,917	2,784,325
1905	179,016	47,276	299,585		153,367	134,276	148,947	(4)		(2)	80,735	1,043,202	3,029,227
1906	286,857	105,091	341,716		288,631	132,805	247,937	(4)		(2)	137,548	1,540,585	3,837,975
1907	251,874	155,980	317,261		324,507	202,253	282,461	(4)		(2)	217,412	1,751,748	4,942,264
1908	240,270	130,184	327,810		318,046	178,904	272,193	(4)		(2)	254,422	1,721,829	4,075,824
1909	319,577	137,697	394,907		403,929	289,517	338,526	(4)		(2)	368,632	2,252,785	5,906,738
1910	322,713	135,088	357,174	103,329	467,339	292,987	162,788	188,559	46,279	(2)	302,801	2,379,057	6,523,029
1911	354,204	122,579	347,296	133,960	472,834	360,858	108,653	179,625	(5)	(2)	243,961	2,323,970	6,462,035
1912	411,186	131,031	384,297	122,408	506,996	262,551	135,074	160,863		(2)	386,351	2,500,757	6,563,908
1913	456,031	110,510	423,896		529,627	254,863	147,876	161,090			515,615	2,599,508	6,774,822
1914	480,404	80,774	393,006		523,368	265,091	113,103	158,814	44,950		416,955	2,476,465	6,395,989
1915	495,860	60,919	389,791		540,914	259,036	110,790	176,306	23,445		390,550	2,447,611	6,596,893
1916	522,293	78,257	457,375		579,827	286,678	161,661	197,785			473,854	2,757,730	7,959,032
1917	461,864	79,331	375,803		606,268	270,538	158,017	257,328			487,077	2,696,226	11,116,452
1918	327,927	54,958	286,768		531,038	199,456	126,208	157,388			373,272	2,057,015	11,470,854
1919	421,279	78,479	339,125	91,756	591,153	251,259	114,313	176,607			356,192	2,420,163	15,727,907
1920	571,895	130,044	382,212	143,929	780,295	277,899	135,279	220,157			487,432	3,129,142	24,533,065
1921	350,247	92,526	408,224	178,275	712,665	363,905	209,201	232,806			342,935	2,890,784	23,700,290
1922	536,905	105,481	471,355	276,859	1,055,302	435,485	242,932	221,914	48,338		385,378	3,779,949	29,361,151
1923	685,041	135,019	586,987	298,390	1,361,116	526,861	290,121	344,104	44,531		481,278	4,753,448	34,888,155
1924	727,385	141,908	577,526	365,714	1,474,491	525,485	316,134	402,245	90,221		421,520	5,042,629	42,724,507
1925	800,167	166,952	649,053	350,130	1,730,254	551,479	320,931	558,132			551,204	5,678,302	47,577,240
1926	802,910	195,440	659,685	350,972	1,723,460	521,205	324,021	533,156	36,333		488,259	5,635,441	46,721,219
1927	792,159	175,351	668,617	327,365	1,675,501	474,320	271,484	508,382			453,709	5,346,888	42,174,454

Notes:- 1/Included in Iowa figures (both Kansas and Texas). 2/Included in Ohio figures (Virginia); Ohio, 1902, figure also included California. 3/Included in Kansas figures (Texas). 4/Included in Oklahoma figures (Texas). 5/Included in Nevada figures (Utah); Nevada 1910, figure included Oregon.

Due to depletion of the deposit this plant closed down in 1923 and ha not been operated since.

Arizona

Gypsum deposits in Arizona have been worked but little. The demand within the State is small and it has been supplied chiefly from adjoining Stat which have abundant supplies. Although gypsum is found more or less throughou the State, the best known localities are in the southeastern part.

At present only one plant is in operation in Arizona. A deposit of gypsite 5 miles east of Douglas and 1-1/2 miles north of the international boundry is the source of raw material for the Arizona Gypsum Plaster Co. The gypsite lies on a gentle sloping plain on the north side of a low hill and is nearly 6 feet thick in some places. The material is free from impurities except for a little shallow soil and vegetable matter at the surface. After stripping this top soil, horse scrapers are used for digging the gypsite and moving it to traps or loading platforms through which it is dumped to wagons below. It is hauled 5 miles over a good road down grade to the mill at Douglas, where it is calcined into plaster. Besides wall plaster this company makes solid and hollow gypsum plaster tile and blocks which in this arid climate may be successfully used for exterior construction.

Another plant at Douglas which started operations in August, 1918, made gypsum products, mostly building blocks and tile, using gypsum from a gypsite deposit near that of the Arizona Gypsum Plaster Co. Upon the expiration of the lease in 1921 this plant ceased operations.

The Acme Cement Plaster Co. worked a rock gypsum quarry for a number of years prior to 1914 at Winslow, on the Atchison, Topeka & Santa Fe Railroad. The raw rock was used at the Portland cement plant at Riverside, Calif., and some was calcined at Los Angeles. Shipments were discontinued in 1914, and the mine was reported to be worked out. Another company, the Navajo Gypsum & Fertilizer Co., held a larger tract of land in the immediate vicinity of that owned by the Acme Company and shipped its rock to California for use as a land plaster. This company also retired from business about the same time as its neighbor.

California

The first recorded use for gypsum rock in California was as land plaster. Grinding plants for this purpose were located at a number of places, and the output as early as 1887 amounted to about 2,700 short tons. In 1892, and for some years afterward, land plaster was made at Coalinga from a 10-foot stratum, and the plaster was used to a considerable extent in the rich fruit belt in Tulare and Fresno Counties. In various parts of Los Angeles, Riverside, and Santa Barbara Counties, gypsum deposits in Tertiary clays have been used for land plaster.

In the last decade of the past century the manufacture of plaster of Paris in the State seems in many cases to have resulted in failure partly on account of the selection of a poor quality of rock, and partly because of the lack of skilled calciners.

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The pioneer in the plaster of Paris industry in California was Mr. John Lucas, who came to the State in 1865 after a number of years' experience as calciner for the Phoenix Plaster Co. of New York City, one of the leading companies in those days. Mr. Lucas experimented with various deposits of gypsum, and finally selected one near San Luis Obispo, California, the rock from which was brought to San Francisco and burned in an ordinary gypsum kettle into the so-called Golden Gate plaster of Paris. The business was continued by his sons until about 1900, when the mill was burned.

During this time gypsum rock was shipped from San Marcos Island in the Gulf of California, nearly 1,500 miles away. This island is 7 miles long and 3 miles wide. A body of gypsum 280 feet thick is exposed over a large portion of it. The rock is cream white in color, compact, of a high degree of purity, and makes an excellent plaster. This deposit to-day is being worked by the Standard Gypsum Co. of San Francisco, and the rock is shipped to their plants at Long Beach, Calif., and Seattle, Wash., for manufacture into all finished gypsum products. This company's operations in Mexico are under the name of Compania Occidental Mexicana, S. A., and the crude products are shipped to the Orient, as well as the two plants named above. It is reported that the Schumaker Wall Board Co., of Los Angeles, Calif., a subsidiary of the Paraffin Company, of California, bought out the Standard Gypsum Co. early in 1929, and is now one of the largest gypsum operators on the West Coast. The company is still to be known under its old name.

The large deposits of high-grade gypsum found at Palmdale, 62 miles northeast of Los Angeles, at one time were exploited by the Alpine Plaster Co., but they have not been worked for a number of years. The New Alpine Co. which took over the old company in August, 1926, owns a deposit covering 240 acres. The deposit has been opened up to a depth of 15 or 20 feet and averages 95 per cent gypsum, but the company has never commenced operations.

Another of the older companies which was known as the Fire Pulp Plaster Co., of Los Angeles, was engaged for a long time in the manufacture of a special kind of wall plaster made by mixing plaster of Paris with clay and asbestos fiber so as to combine fireproof qualities, slow set, and durability.

The following table shows the production of crude gypsum in California for the years 1887 to 1927. The figures for 1928 are not yet available.

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Production of crude gypsum in California, 1887 - 1929.[1]

Year	Short tons	Value	Year	Short tons	Value
1887	2,700	$27,000	1907	8,900	$57,700
1888	2,500	25,000	1908	34,600	155,400
1889	3,000	30,000	1909	30,700	138,176
1890	3,000	30,000	1910	45,294	129,152
1891	2,000	20,000	1911	31,457	101,475
1892	2,000	20,000	1912	37,529	117,388
1893	1,620	14,280	1913	47,100	135,056
1894	2,446	24,584	1914	29,734	78,375
1895	5,158	51,014	1915	20,200	48,953
1896	1,310	12,580	1916	33,384	59,533
1897	2,200	19,250	1917	30,825	56,840
1898	3,100	23,600	1918	19,695	37,176
1899	3,663	14,950	1919	19,813	30,579
1900	2,522	10,088	1920	20,507	92,535
1901	3,875	38,750	1921	37,412	78,875
1902	10,200	53,500	1922	47,084	188,336
1903	6,914	46,441	1923	86,410	289,136
1904	8,350	56,592	1924	25,569	53,210
1905	12,859	54,500	1925	107,613	172,444
1906	21,000	69,000	1926	114,868	211,337
			1927	94,630	292,090

1 Division of Mines & Mining, Dept. of Natural Resources, Calif. Mineral Production for 1927, p. 90.

In California many plants have sprung up almost overnight only to disappear nearly as rapidly.

Among the more important companies that have started operations but have either closed down or have been taken over by one of the larger producing companies are the following:

The Mineral Fertilizer Co. of Los Angeles, Calif., formerly the Natural Fertilizer Co. Its plant at Riverside started production in 1914 and closed down in 1918.

The Pacific Cement Plaster Co. with a deposit at Amboy, Calif., started operations in 1906. It changed its name in 1909 to the Consolidated Pacific Cement Plaster Co. and in 1919 was taken over by the United States Gypsum Co.

The Paoli Gypsum Co. of Fresno, Calif. This company with a plant at Mendota, started operation in 1908 and closed down in 1913.

The Fire Pulp Plaster Co. of Los Angeles, started operation in 1906 at Palmdale, changed its name to the Acme Cement Plaster Co. in 1908 and closed down in 1910.

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The McKittrick Gypsum Co. started production at McKittrick, Kern Co., Calif., in 1906 and went out of business in 1916.

The Lyons Gypsum Co. started production at King City, Calif., in 1898; was idle in 1900, again began operating in 1901, and closed down in 1915.

Colorado

Though gypsum is widely distributed in Colorado, and the supply is almost unlimited, only two deposits are being worked at present, one near Arkins, 5 miles west of Loveland, in Larimer County, the other at Coaldale, in the extreme western part of Fremont County. Quarries have been worked in the past, however, at Ruedi, Eagle County, near Perry Park, and at the entrance to the Garden of the Gods, near Colorado City, El Paso County. Gypsum beds have been prospected on Bear Creek, near Morrison, in Jefferson County, and 8 miles southeast of Morrison on Deer Creek.

The deposit near Arkins has been quarried for many years by the Consolidated Plaster Co. Their mills had a capacity of 40 tons in 10 hours, and used 6-ton kettles. They manufactured plaster of Paris, dental plaster, and wall plaster. This deposit and plant is now owned by the United States Gypsum Co., of Chicago, Ill. The mill at present has a capacity of 125 tons daily, employing two 10-foot diameter kettles. The deposit ranges in thickness from 12 to 36 feet and averages about 25 feet. The color of the rock varies from gray to white, and the texture is fine granular. It is convenient to transportation facilities, easily quarried, and makes excellent gypsum products. A few tons are sold yearly for agricultural purposes, but the major part is used for plaster of Paris and wall plaster.

The deposit at Coaldale, in the extreme western part of Fremont County was worked by the Portland Cement Co. from 1903, when it was first opened up to 1908, when the name was changed to Colorado Portland Cement Co. The crude gypsum is shipped eastward to Portland, where this company operates an up-to-date plant for the manufacture of wall plaster. Practically half of the output is shipped crude to the company's cement plant at Portland to be used as a retarder in the manufacture of cement. This company operates three kettles in its plaster mill, which has an output of about 100 tons of plaster daily.

In the past the United States Portland Cement Co., of Concrete, Colo., mined gypsum for their cement plant at a point about 4 miles northwest of Stowe City, in Fremont County. Both the plant and quarry, however, are shut down at the present time. The gypsum of this region occurs in comparatively thin masses interruptedly over an area 10 to 13 miles long from north to south, and about 7 miles wide from east to west. It is of excellent quality for use as retarder in Portland cement.

At Ruedi, on Frying Pan Creek in Eagle County, a plaster mill was in operation for a few years, but it has been closed down for a long time. A few carloads of gypsum have been shipped from Gypsum to the Colorado Portland Cement Co.'s plant at Portland for use in the manufacture of cement.

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Several other companies have started operations in different sections of Colorado, but all have closed down for one reason or another. Notable among these were the Roaring Forks Plaster Co., which started operating a plant at Ruedi, Eagle County, in 1907 but closed down in 1911; the Red Canyon Gypsum Co. of Denver, which operated in 1913 but closed down in 1914; C. W. Kinsman's mill at Colorado City, which started production in 1900 but was abandoned in 1907; The Loveland Plaster & Mfg. Co., Larimer County, which started production in 1908, closed down in 1914, and in 1916 abandoned the mine and dismantled the mill; the Perry Park Stucco & Land Plaster Co., Perry Park, Colo., which started production in 1898 and closed down in 1901.

Iowa

Iowa is the second largest producer of gypsum in the United States, and has lead Michigan since 1910. The industry is situated in the vicinity of Fort Dodge, Webster County, and Centerville, Appanoose County. In the Webster County district the industry began with the erection of the first gypsum mill at the head of Two Mile Creek in 1872. At this time calcined gypsum was used only as plaster of Paris and for mixing with lime for finish-coat work in plastering. Six years later gypsum plaster for basecoat work was first put on the market, and from this beginning the industry in Iowa steadily increased until in 1910 the Centerville deposits were opened up to place Iowa second among the gypsum producing States. The second mill was erected in 1882, some little distance down the creek from the other, and three years later the Blandon Mill was erected on the Des Moines River below Fort Dodge. These three companies later combined to form the Iowa Plaster Association, and in 1887 the Duncombe Mill was built at the mouth of Two Mile Creek.

In 1899 the Cardiff Gypsum Co., which is still in business to-day, sank a shaft and erected a mill on the open prairie. During 1900 and 1901 two other mills were erected, and in 1902 the newly organized United States Gypsum Co. took over all the mills with the exception of the Cardiff plant. This was really the beginning of the growth in the plaster business in this section of Iowa. Several other plants were erected during the next 10 years, among them being the Plymouth Mill, the Iowa Hard Plaster Mill, the Acme Mill, and the Wasem Mill. All of these plants have burned, been dismantled, or taken over by other companies, with the exception of the Cardiff and the Wasem plants, which are still running to-day under the old names.

The following are the companies actively engaged in the gypsum industry at Fort Dodge in Webster County, in 1928:

Certain-teed Products Corporations,
Universal Gypsum and Lime Co.,
United States Gypsum Co.,
Hawkeye Gypsum Products Co.,
Wasem Plaster Co.,
Cardiff Gypsum Plaster Co.

There is also the Johnson Clay Works which is not primarily a producer of gypsum, but in the production of clay it mines some gypsum which it sells to cement manufacturers in the district.

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Gypsum was first discovered in the Centerville district in 1910 when the Scandinavian Coal Co. in prospecting for coal drilled through a bed of gypsum. Additional drilling proved the presence of gypsum in commercial quantities, and in July, 1912, a shaft was started. Due to the considerable quantities of water encountered, no further work was done until 1917; the water was then cut off and a two-kettle mill erected, which is still in operation under the name of the Federal Gypsum Co.

The production of gypsum in these two districts of Iowa reached 802,810 short tons in 1926 (764,044 tons in 1928), as compared with only 20,900 tons in 1890 from the Webster County deposits. Production fluctuated between 12,000 and 31,000 tons until in 1899 it advanced to 75,574 tons, but with the beginning of the twentieth century the industry increased with remarkable strides, and upon the discovery of gypsum in commercial quantities in the Centerville district in 1910, Iowa took second place as a producer of this mineral.

In contrast with New York, the sales of crude gypsum in Iowa from 1890 on, never exceeded the sales of gypsum used for calcining.

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Table 3. - Sales of gypsum in Iowa, 1890 - 1928.

	Crude		Calcined			Crude		Calcined	
	Short tons	Value	Short tons	Value		Short tons	Value	Short tons	Value
1890	2,900	$2,350	18,000	$45,000	1909	18,128	$26,099	188,389	$629,503
1891	4,822	4,845	21,049	53,250	1910	36,691	46,995	230,932	896,854
1892	(1)	(1)	(1)	(1)	1911	(2)	(2)	229,890	857,287
1893	2,962	2,378	14,273	53,160	1912	42,443	40,824	273,116	804,804
1894	1,900	2,700	13,000	42,000	1913	52,057	45,551	333,357	1,112,388
1895	1,200	600	16,000	36,000	1914	65,185	60,486	335,065	1,260,971
1896	652	665	14,285	35,355	1915	71,909	59,930	335,057	1,218,198
1897	(2)1,089	(2)1,551	(2)62,657	(2)253,028	1916	60,846	59,297	373,416	1,437,498
1898	(2)1,127	(2)1,707	(2)64,477	(2)235,501	1917	65,012	110,741	322,198	1,931,256
1899	(2)20,284	(2)23,483	(2)106,272	(2)520,427	1918	57,719	160,148	218,178	1,786,266
1900	(3) 3,450	(3)4,805	(3)233,120	(3)899,458	1919	69,024	231,432	864,656	2,403,012
1901	(3)5,829	(3)8,600	(3)164,720	(3)620,736	1920	110,839	414,431	321,400	4,008,534
1902	(3)5,288	(3)7,677	(3)232,385	(3)799,678	1921	84,657	234,038	216,930	2,688,662
1903	(3)12,184	(3)21,103	(3)244,072	(3)1,065,942	1922	125,514	359,638	326,937	3,786,544
1904	2,946	6,039	113,931	469,393	1923	134,895	385,283	431,829	4,983,249
1905	6,216	12,280	124,018	576,775	1924	151,208	379,429	489,745	5,277,910
1906	13,613	22,336	146,526	551,162	1925	140,451	381,584	562,210	6,352,687
1907	18,834	29,115	162,965	701,268	1926	129,803	296,854	553,498	6,291,349
1908	21,944	30,105	158,043	535,540	1927	139,637	391,701	584,305	6,321,796
					1928	154,596	247,263	565,140	5,107,951

(1) Data not available. (2) Includes Kansas. (3) Includes Kansas and Texas.

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Kansas

The gypsum deposits of Kansas comprise extensive beds of rock gypsum and a number of deposits of secondary gypsum or gypsite. Some of the rock gypsum is suited to the manufacture of the finer grades of plaster of Paris, and the gypsite is particularly adapted for wall and other coarser grades of plaster.

Excellent facilities favored gypsum plaster manufacture in Kansas, and as railroads served each of the three areas - in the north at Blue Rapids in Marshall County, in the central part at Gypsum City in Saline County and Dillon in Dickinson County, and in the south at Medicine Lodge, in Barber County - the industry became more and more important. To-day, however, the industry has died out in the central part of the State, both in Saline and Dickinson Counties.

Secondary gypsum deposits were first utilized in Kansas. Discovery was made in 1873 near Gypsum City, but this deposit was not worked for plaster until 1889, and was abandoned about 1893. For a number of years the darker color of plaster made from gypsite hindered its sale, especially since the whiter plaster obtainable from the rock was regarded as stronger. With the construction of the ornamental buildings at the World's Fair, in Chicago, this earthy gypsum plaster was found to be adapted to staff work and large amounts were so used. A little later the plasterers became interested, and many have regarded gypsite plaster as better adapted for certain work than that manufactured from the rock.

The first deposits of rock gypsum worked in Kansas were in the northern area. The first mill was erected at Blue Rapids in 1872. This mill was operated by Coon and Son until 1884, when it changed hands; in 1889 a flood caused considerable damage to the property, and it was abandoned. In 1887 a frame mill of one-kettle capacity was built on the west side of the town of Blue Rapids, at what was known as the Fowler mine, and was called the Blue Rapids Plaster Co. The Great Western Plaster Co. and the Blue Valley Plaster Co. also worked gypsum deposits in the vicinity of Blue Rapids prior to 1900.

To the southwest of Blue Rapids, at Solomon, Dickinson County, the Crown Plaster Co., which later became consolidated with the Kansas Cement Plaster Co., operated until 1898, when it was abandoned due to the great depth of the deposit and the intermingling of shale with the gypsum. Further south at Hope the Kansas Cement Plaster Co. operated a mine and plant for the manufacture of wall plaster.

The southern gypsum area is the largest in Kansas, and with its continuation into Oklahoma and Texas forms the largest gypsum area in the United States. At Medicine Lodge in Barber County the Best Brothers plant manufactures hard plaster for shipment to nearly all markets in the United States, so well known are its qualities.

At present there are three companies operating in Kansas, the United States Gypsum Co., the Certain-teed Products Co. at Blue Rapids, and the Best Brothers Keene's Cement Co. at Medicine Lodge.

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The following table shows the sales of crude and calcined gypsum in Kansas for the years 1890 to 1928. Very little of the gypsum sold crude in Kansas is used as a land plaster, the larger part being used in the cement industry. Because of its purity this gypsum is not largely used for the manufacture of hard and wall plasters which are shipped considerable distances into other States.

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Table 4. - Sales of crude and calcined gypsum in Kansas

	Crude		Calcined			Crude		Calcined	
	Short tons	Value	Short tons	Value		Short tons	Value	Short tons	Value
1890	80	$215	19,420	$72,242	1909	(4)40,110	$47,034	78,546	$274,787
1891	710	1,490	28,468	159,832	1910	(5)45,610	57,194	75,445	320,028
1892	420	840	31,961	194,357	1911	(6)51,927	56,467	70,795	288,736
1893	253	624	29,975	180,975	1912	29,356	25,341	80,002	299,479
1894	647	1,854	49,273	300,030	1913	32,696	26,992	64,236	281,316
1895	540	952	54,465	271,579	1914	23,796	22,531	47,877	255,812
1896	292	563	37,214	147,808	1915	17,332	14,887	40,634	235,127
1897	(1)1,740	900	(1)62,657	253,028	1916	17,993	18,644	48,442	304,141
1898	(1)1,127	1,707	(1)64,477	235,501	1917	- - -	- - -	(7)75,910	424,611
1899	(1)20,284	23,483	(1)106,272	520,427	1918	- - -	- - -	(7)46,710	34,749
1900	(2)3,450	4,805	(2)233,120	899,458	1919	- - -	- - -	(7)66,008	520,673
1901	(2)5,829	8,600	(2)164,720	620,736	1920	(8)	(8)	78,347	834,334
1902	(2)5,288	7,677	(2)232,385	799,678	1921	(8)	(8)	50,663	574,601
1903	(2)21,184	21,103	(2)244,072	1,065,942	1922	(8)	(8)	57,998	604,093
1904	(3)9,709	14,217	132,851	538,143	1923	(8)	(8)	71,349	700,490
1905	11,604	16,206	29,952	134,196	1924	47,519	116,750	77,796	777,512
1906	20,094	22,910	64,351	224,662	1925	52,869	126,886	87,656	882,624
1907	30,606	39,936	96,347	374,330	1926	47,641	108,792	111,174	1,111,928
1908	27,226	32,726	80,523	248,613	1927	37,027	67,474	98,737	908,175
					1928	33,782	51,427	69,974	884,168

(1) Includes Iowa. (2) Includes Iowa and Texas. (3) Includes Texas. (4) Includes Oklahoma.
(5) Includes Oklahoma and Texas. (6) Includes Oklahoma, Texas, and Iowa. (7) Includes some crude gypsum.
(8) Data not available.

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Michigan

Michigan has extensive deposits of gypsum. Those of the western part of the State are situated on the Grand River near Grand Rapids and Grandville, in Kent County. In the eastern part the beds are found at Alabaster, in Iosco County, and also a little to the south at Kawkawlin and Bay City in Bay County.

In the early days most of the gypsum mined was ground into land plaster. The unlimited supply of gypsum in Michigan soon enabled the producers to more than meet the demand for land plaster. The bulky nature and the low price of the product did not permit shipments for any great distances, so that the producers were forced to turn their attention to the manufacture of the calcined product. With the introduction of new methods and the flue-kilns from New York in 1871, the calcining of gypsum became the more important industry. After 1887, the calcined product always exceeded in amount that of the land plaster which has now become a product of little importance when compared with the former.

The following table shows the production of land plaster and plaster of Paris in Michigan prior to 1891:

Table 5. - Production of Land Plaster and Plaster of Paris in Michigan, prior to 1891[1]

Years	Land Plaster (short tons)	Plaster of Paris (barrels of 300 pounds)	Years	Land Plaster (short tons)	Plaster of Paris (barrels of 300 pounds)
Prior to 1860	(1) 100,000	- - -	1878	40,000	48,346
1866	14,604	- - -	1879	43,658	50,800
1867	17,439	- - -	1830	49,570	106,004
Prior to 1868	- - -	(2) 80,000	1881	33,178	112,813
1868	28,837	34,966	1882	37,821	135,165
1869	29,996	41,187	1883	33,227	201,133
1870	31,437	46,179	1884	27,888	156,677
1871	41,126	48,685	1885	28,184	141,575
1872	43,536	59,767	1886	29,378	153,274
1873	44,972	62,453	1887	28,794	170,107
1874	39,126	82,449	1888	22,177	196,698
1875	27,019	61,120	1889	19,825	206,080
1876	(2) 39,131	64,386	1890	29,500	238,700
1877	(2) 40,000	(2) 55,000			

1 Mineral Resources of the United States, U. S. Geol. Survey, 1890, pg. 467.
2 Partly estimated.

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In 1892 the demand for gypsum plasters in the construction of temporary buildings at the World's Fair at Chicago gave a great impetus to the industry.

Notwithstanding this impetus it was not until 1901 that the remarkable growth began. Up to this time the industry was in the hands of individuals or separate companies. Competition had kept profits down to such a point that proper equipment for mining and manufacture were not possible. The widespread use of plaster of Paris, floor cement, and wall plaster has since raised production from 66,519 tons in 1895 to the high watermark of 394,907 tons in 1909, and has given Michigan second place as a gypsum producer. In 1868 the total production was valued at $165,298, and that of 1909 at $1,213,347. In 1901 the era of consolidation began with the consolidated control of some of the mills under one company. The consolidation of interests has continued up to the present. The mines of the State are now owned or controlled by a few large companies which mine and manufacture with equipment much superior to what was possible under the old régime.

The following table shows the sales of crude and calcined gypsum in Michigan from 1890 to 1928, inclusive.

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Table 6. - Sales of Gypsum in Michigan, 1890 to 1928

	Crude		Calcined			Crude		Calcined	
	Short tons	Value	Short tons	Value		Short tons	Value	Short ton	Value
1890	27,714	$43,980	47,173	$148,119	1909	57,671	78,958	344,171	1,134,389
1891	26,100	50,550	44,860	173,175	1910	64,566	88,378	240,905	579,823
1892	61,958	93,276	53,105	213,251	1911	79,050	85,255	206,299	488,671
1893	47,263	90,562	62,031	213,359	1912	63,919	61,845	243,656	559,702
1894	31,928	61,123	38,555	128,493	1913	60,706	55,969	278,368	665,356
1895	15,491	29,697	40,895	144,310	1914	61,227	51,242	249,648	654,599
1896	7,282	10,008	46,921	136,416	1915	69,572	63,236	245,484	623,073
1897	23,194	29,666	59,340	163,910	1916	80,298	90,973	292,109	975,626
1898	15,329	22,477	63,005	181,833	1917	68,155	116,653	257,588	145,200
1899	56,461	74,208	71,543	209,329	1918	46,608	131,438	207,059	1,629,711
1900	42,682	54,340	70,489	230,779	1919	58,754	174,110	250,687	2,216,257
1901	55,894	58,694	103,933	208,549	1920	73,842	268,968	261,499	3,252,060
1902	81,907	86,800	126,656	372,821	1921	110,677	369,185	240,648	2,942,911
1903	70,974	79,849	165,122	621,063	1922	107,708	291,295	275,885	2,551,822
1904	52,963	57,859	158,266	483,338	1923	135,616	355,067	341,746	2,897,926
1905	44,569	48,930	203,313	585,504	1924	124,134	324,140	453,135	5,626,682
1906	57,737	111,019	208,715	642,859	1925	155,961	391,093	477,076	5,056,201
1907	52,043	80,662	197,666	600,689	1926	157,787	379,848	455,616	4,641,617
1908	51,738	67,054	192,403	424,874	1927	178,378	331,837	429,639	3,884,687
					1928	199,036	243,891	460,143	2,915,478

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The United States Gypsum Co. is erecting a new and up-to-date plant at Detroit, and will use rock brought down from Alabaster by water. Considerable work is being done at Alabaster in order to facilitate loading of gypsum for the Detroit plant and the new plant being erected at Chicago. The National Gypsum Co.'s new plant at National City, Mich., is in operation and manufactures practically all gypsum products. This is one of the very complete and efficient plants in the region. Following is a list of plants in Michigan:

Iosco County:

United States Gypsum Co.	Alabaster
National Gypsum Co.	National City

Kent County:

Certain-teed Products Co.	Grand Rapids
Grand Rapids Plaster Co.	Grandville
Michigan Gypsum Co.	Grand Rapids
Plaster Dept. of the Alabastine Co.	
United States Gypsum Co.	Grand Rapids

Wayne County:

United States Gypsum Co.	Detroit
Warehouse at present - new manufacturing plant being constructed.	

Montana

The economic deposits of gypsum in Montana may be divided into three general fields - the north, middle, and south fields - running from northwest to southeast across the State a little east of the Continental Divide. The north field which included two large deposits - one near the towns of Armington and Kibbey in Cascade County and the other in the Big Snowy Mountains near Portuguese in Fergus County. The south field is located in Carbon County, the deposit being in the vicinity of Bridger. The middle field is in Jefferson County, a good deposit being located near Lime Spur.

Perhaps the first commercial use made of native gypsum in the State was in 1894, and the first discovery was in the year previous.

During 1898-99 gypsum was quarried about 1 mile west of Kibbey in Cascade County and was milled at Monarch, but when the plant burned in 1900 operations at this point were discontinued and the same owner opened up a deposit 9 miles northwest of Kibbey. A new plant was erected immediately just below the deposit directly on the Neihart branch of the Great Northern Railroad, 6 miles above Armington on Belt Creek, and 34 miles from Great Falls. Both the mine and the two mills, one of the latter being erected at Great Falls about 1908, discontinued operation in 1915.

At Goodman, three miles north of Riceville, an attempt to mine gypsum was unsuccessful. A small gypsum mill was erected in 1900, evidently before thorough prospecting of the deposit, as the gypsum was found only in lenticular masses and thin seams embedded in red clay.

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An effort to develop the bed on the west side of Belt Creek about a mile north of Goodman, had the same result, as only small bodies of gypsum were found.

At Hanover, in Fergus County, the Hanover Gypsum Co. opened up a deposit and constructed a plant which went into operation in 1916. This plant was taken over immediately by the Three Forks Portland Cement Co. of Denver, Colo., who closed it down until 1918; it was then reopened and is still in operation to-da

In Carbon County, A. F.Pillsbury of Minneapolis, Minn., opened a plant at Bridger and operated it from 1905 to 1908.

Nevada

The deposits of rock gypsum occur in two widely separated areas or provinces in Nevada - in western Nevada and in the extreme southern part of the State. The western province includes the deposits near Lovelock and Table Mountain, in southern Humbolt County; near Gerlach, in central Washoe County; at Mound House, in Ormsby County; at Ludwig, in Lyon County; and near Hawthorne, in Mineral County. These deposits are all masses or beds of coarsely crystalline rock gypsum and are extremely pure.

The southern group is confined to Clark and southern Lincoln Counties, and includes the deposits near Arden and those in the mountains in the vicinity of Moapa and Logan. The gypsum is massive and granular and varies in color from white to red. Some alabaster has been noted near Moapa.

In recent years considerable search for suitable deposits of gypsum has been made throughout the State, but as far as known none has been found outside of the two general areas mentioned.

During the weathering of gypsum deposits more or less of the gypsum is removed, chiefly in solution. In the dry climate of Nevada, the surface waters carrying the gypsum in solution usually evaporate near the original deposits and form gypsum earth or gypsite. These secondary deposits are sometimes large enough to work profitably, and for a number of years certain of them have been utilized near Mound House. Elsewhere the deposits are mostly too small, or contain too much foreign material to be of value.

The deposit at the western base of the Humbolt Mountains, $4\frac{1}{2}$ miles east from Lovelock, was the first to be exploited. Considerable work was done there in 1891 to 1893, but during the period of financial depression in 1893 the work was abandoned. Later a local company was organized to work the deposit.

The second deposit worked is in the Virginia Mountains, $1\frac{1}{2}$ miles west of Mound House. Here the gypsum was hauled to Empire, where it was manufactured. Since 1904 quarries have been opened at Ludwig, Arden, Mason, and near Gerlach.

Various other deposits have been opened up and plants erected. Several have changed hands a number of times, but all have closed down with the exception of the Pacific Portland Cement Co. at Empire, near Gerlach, the Standard Gypsum Co. at Ludwig, the Blue Diamond Co. at Arden, Regan Brothers at Mason, and the United States Gypsum Co. at Arden.

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Among the more important enterprises the following may be mentioned: The Mound House Plaster Co. with a deposit at Mound House, Lyon County, and a mill at Emeryville, Calif; this company started operation in 1909, was idle in 1913, and was purchased in 1915 by the American Asbestos Co. who have never had the plant in operation. The Ludwig Mines Co. of Yerington started operations at Ludwig about 1909 but sold the property to the Nevada-Douglas Consolidated Copper Co., who in turn leased it to the Pacific Portland Cement Co. in 1920 and 1921; in 1922 the Standard Gypsum Co. of California took over the lease and have been operating it ever since. The Western Gypsite Co. at Lovelocks started operations in 1909, but the plant and deposit was purchased by the Pacific Portland Cement Co. in 1912 and was abandoned thereafter. The Arrowhead Plaster Co. of Moapa, which went into bankruptcy in 1912, started operations again under the name of Moapa Gypsum Co.; this company sold out to the White Star Plaster Co. in 1916. It began operations in 1919 but due to litigation soon closed down. The Great Western Gypsum Co. operated at Arden for several years but finally closed down.

New Mexico

Gypsum is found so generally distributed in New Mexico and occurs in such vast deposits and in such variety of forms that the supply is practically inexhaustible. The beds are thick, and most of the material is exceptionally pure.

Until 1902, however, no attempt to utilize the gypsum in a commercial way had proved successful. A number of efforts have failed because of high freight rates and small, restricted local markets. Gypsum is used to a limited extent by the Mexicans, who generally have in their villages a pile of "hieso," which is calcined in ovens as needed and used for plastering the interior of their houses. Some has also been ground and used as land plaster in attempts to reclaim alkali lands. Gypsum tends to transform the "black alkali" to a less harmful salt and is practically the only substance which has been shown to benefit these lands, but its effect is slow and the treatment is more or less expensive.

In 1902 the first production of gypsum on a commercial scale was reported. The Rock Island Cement and Plaster Co. was operating a small test plant at Ancho, 25 miles north of Carrizozo, Lincoln County, on the Rock Island Railroad (now the Southern Pacific Railroad). The material was earthy gypsum or gypsite which was dug by horse-drawn scrapers, put through coarse screens, calcined in iron hoppers, and finally put through a 35-mesh screen. This plant was sold on January 1, 1911, to the Western Clay and Gypsum Products Co., and after being idle from 1913 to 1915, it was again sold in 1916 to the Ancho Brick Co. who closed it down permanently the following year.

The White Sands Co. started operations in 1908, using the gypsum sands of Tularosa Desert, 12 miles west of Alamogordo. These sands lie mainly in Otero County, but extend a short distance into the east side of Dona Ana County. They extend 28 miles from north to south, range from 6 to 15 miles in width, and cover an area of about 270 square miles. Their eastern edge lies 11¼ miles west of Alamogordo station on the Southern Pacific Railroad. Most of the deposit is in dunes 10 to 30 feet high, the average thickness probably being nearly 20

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feet. A large part of the material is snow-white, resembling snowdrifts.

In 1916 the National Cement Plaster Co. bought out the White Sands Co. and operated on a small scale during that year, after which it closed down. Occasional shipments of this gypsum sand is hauled to Alamogordo from time to time, but owing to the slight demand and the distance to the larger markets the prospects of operating this deposit on a large scale appear very small at present. Several companies have been reported as organized to operate this deposit, but their activities have never materialized.

The National Plaster Co., which operated a plant at Oriental in Eddy County, N. Mex., prior to 1917, sold out to the Globe Plaster and Mining Co. of Kansas City, Mo., in November, 1917. This plant operated until April, 1923, at which time it closed down. The deposit was gypsite, which was hauled about 1½ miles by gasoline locomotives.

At present the only plant in operation in New Mexico is located at Acme in Chaves County, about 18 miles north of Roswell on the Pecos branch of the Atchison, Topeka & Santa Fe Railroad. The deposit consists of gypsite; the material is loaded by scrapers hauled by a tractor, and is then brought downhill into the plant about 200 yards in cars.

New York

New York, which has extensive deposits in the district between Buffalo and Rochester, is the largest producer of gypsum in the United States. It is of interest also that New York was one of the first States to use gypsum in substantial quantities. At an early date it was importing thousands of tons annually for use as fertilizer. There is no record of the first gypsum produced in the State for use as fertilizer, but in 1835 production for use as a plaster was first recorded; from this small beginning the industry gradually developed in every gypsum locality where the population was sufficiently dense to offer a market for gypsum plasters.

The history of the gypsum industry in New York is replete with failures. Plants erected at the most likely deposits began operations only to find that there was no market, or if so, that competition was too keen, and they were compelled to close down. The Bureau of Mines has on file a list of 55 such companies, the majority of which never went into operation. As the industry grew, the New York mines suffered from the competition of Canadian gypsum due to their great distance from the more important consuming centers and to transportation difficulties which favored the importation of gypsum from Nova Scotia. With the exception of a small (but rapidly growing) consumption in New England, Pennsylvania, and New Jersey, the crude gypsum imported from Canada is consumed in New York and the majority of it is shipped direct to New York City for manufacture.

The production of gypsum in New York reached 1,730,254 short tons in 1925, the highest ever recorded. This compares very favorably with only 32,903 tons in 1890, or less than half of that produced in Michigan during the same year. The production of gypsum grew quite slowly during the last decade of the nineteenth century due not only to the importation of Canadian rock but

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to the decline in the use of gypsum as fertilizer. There were at least two reasons for the decline in the use of gypsum as land plaster; the first was the rapid growth in the demand for calcined plasters which absorbed the attention of the gypsum producers so that they made no effort to increase their sales to farmers, and the second was the active introduction of potash, nitrate, and phosphate fertilizers as the merits of these new materials became better known. Moreover, on land where it had been used continuously for years, land plaster failed in time to yield the same excellent results obtained from the first few applications, whereas the new fertilizers proved very helpful.

The use of calcined gypsum, on the other hand, made rapid and permanent progress in New York as elsewhere, and as the process of calcining was improved, the proportion of gypsum used for calcining far outstripped that for other purposes.

Despite all handicaps the sales of gypsum in New York, both crude and calcined, have shown a steady increase. The falling off of sales of gypsum as fertilizer has been more than offset by its use as a retarder in Portland cement. In 1925 the sales of crude or uncalcined gypsum produced in New York amounted to 354,394 tons, or 35 per cent of the total sales of crude in the United States, and 1,193,520 tons of calcined gypsum, or 29 per cent of the total sales. This was the record year in the gypsum industry in the United States. In addition, substantial quantities of imported gypsum were sold in the State.

The following table shows the sales of domestic crude and calcined gypsum in New York for the years 1890 to 1928, inclusive.

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Table 7. - Sales of gypsum in New York

Year	Crude		Calcined		Year	Crude		Calcined	
	Short tons	Value	Short tons	Value		Short tons	Value	Short tons	Value
1890	32,903	$75,093	- - -	- - -	1909	147,465	$235,915	218,159	$796,735
1891	30,135	58,571	- - -	- - -	1910	173,160	265,610	248,862	888,367
1892	32,294	60,700	75	$ 400	1911	157,682	231,329	268,785	968,267
1893	33,781	57,419	1,813	7,973	1912	180,946	247,952	274,155	993,562
1894	27,358	44,878	3,335	15,384	1913	188,482	276,955	282,187	1,003,744
1895	28,947	43,156	3,480	16,165	1914	178,819	259,842	279,449	977,350
1896	23,325	32,812	- - -	- - -	1915	184,517	268,467	293,870	999,239
1897	21,220	37,884	9,200	40,800	1916	195,246	292,032	311,264	1,167,555
1898	19,355	41,419	9,275	40,550	1917	223,392	421,071	295,646	1,872,347
1899	15,824	26,927	26,443	78,566	1918	183,107	456,639	275,333	2,213,460
1900	22,846	43,414	27,979	102,174	1919	216,417	620,339	316,767	2,910,404
1901	45,269	72,001	55,273	169,668	1920	271,077	987,503	387,856	5,451,426
1902	35,134	58,934	60,184	200,236	1921	206,304	694,518	418,695	5,715,703
1903	47,154	92,831	75,613	369,552	1922	281,530	851,385	631,735	7,955,981
1904	44,550	85,279	91,794	374,079	1923	230,080	717,999	823,241	9,626,746
1905	31,480	66,991	161,599	704,147	1924	335,841	982,777	1,019,319	13,346,469
1906	80,516	176,282	161,218	573,614	1925	354,394	1,017,403	1,185,142	15,202,503
1907	107,437	211,113	145,132	589,112	1926	328,086	905,095	1,246,822	15,889,494
1908	100,858	186,002	160,930	574,757	1927	290,368	792,410	1,291,967	14,096,980
					1928	268,691	636,645	1,068,222	8,976,662

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In 1890 all of the gypsum was sold uncalcined - 3,072 tons crude and 29,331 tons as land plaster. It was not until 1892 that production figures for gypsum as calcined for plaster were published for New York State, and in that year only 100 tons were calcined (producing 75 tons of plaster). Thenceforth, however, the growth of the gypsum calcining industry in New York was very rapid.

The industry in New York may be divided into two parts, according to sources of raw material. The western area, comprising the district between Buffalo and Rochester, depends upon local deposits for its raw material, while the eastern area, including the vicinity of New York City, uses imported rock from Canada.

The industry and the companies operating in the western district are as follows:

Erie County:

Certain-teed Products Corp., Akron.
National Gypsum Co., Clarence Center.
Atlas Gypsum Corp., Clarence Center.
Universal Gypsum & Lime Co., Akron.
Standard Gypsum Co., Clarence Center.

Genesee County:

Niagara Gypsum Co., Oakfield.
Oakfield Gypsum Products Corp., Alabama.
United States Gypsum Co., Oakfield.
Phoenix Gypsum Co., Alabama.

Monroe County:

Ebsary Gypsum Co., Inc., Wheatland.
Empire Gypsum Co., Garbutt.
Lycoming Calcining Co., Garbutt.

Ontario County:

Victor Plaster Co., Victor.

These companies manufacture practically every product made from gypsum, and due to their extensive market territory are in a position to keep their plants operating near capacity the entire year. Several of these companies have warehouses at the larger consuming points in order to compete more advantageously with local plants.

In the eastern district the industry is located mainly in and near New York City. The Universal Gypsum and Lime Co., which in 1927 purchased the plant of the Higginson Manufacturing Co. at Newburg, up the Hudson River from New York City, will continue operations using gypsum imported from Canada. The two companies furnishing gypsum products for New York City are the United States Gypsum Co., located on Staten Island, and the Atlantic Gypsum Co., in

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New York City. Both of these companies use Canadian gypsum, which is brought down from Nova Scotia by water; the former company owns the ships in which its rock is carried.

Plants situated in the western part of the State have in the past experienced some difficulty in competing with the plants near New York for a share of the business in that city.

Ohio

Gypsum is mined in only one area in Ohio, the district between Gypsum and Port Clinton in Ottawa County, about 10 miles west of Sandusky. The industry began in 1846 when Marsh and Co. built a mill at Sandusky which was supplied from a quarry in the vicinity of Gypsum. In 1872 this company built a mill at Gypsum and quarried gypsum rock from an open cut. In 1885 the mill capacity was doubled, and again in 1890 when underground mining was started from a tunnel. Later a shaft was sunk (46 feet deep) on a new tract to the west of the mill. An attempt was made in 1885 to introduce the roller process for grinding the rock prior to calcining, but this failed and the old buhrstone mills were used once more.

The mill called the Fletcher mill, now owned by the United States Gypsum Co., was built in 1898. Several years ago a new plant replaced the old one at this place. This plant was equipped with two 10-foot kettles, and the rock from the quarry was dried in a rotary drier having a daily capacity of about 110 tons requiring one-half ton of coke a day.

The agricultural element in Ohio was slow to adopt gypsum as a fertilizing agent, with the result that the sales of crude gypsum for this purpose rarely exceeded those of calcined gypsum even in the early years. Most of the material sold as land plaster was shipped into neighboring States, principally to Michigan.

As there were usually only one or two plants in operation, the published figures for gypsum sales in Ohio are ordinarily included with those of other States. The following table gives the sales of crude and calcined gypsum from 1890 to 1928, in so far as possible without disclosing pertinent facts concerning any one company.

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Table 8. - Sales of crude and calcined gypsum in Ohio

	Crude		Calcined	
	Short tons	Value	Short tons	Value
1890				
1891	(1)	(1)	(1)	(1)
1892				
1893	(2) 3,306	(2)7,845	(2)9,624	(2)45,411
1894	6,427	16,826	11,472	52,771
1895	9,962	22,942	9,350	48,262
1896				
1897				
1898	(1)	(1)	(1)	(1)
1899				
1900				
1901				
1902	(3)18,717	42,240	66,263	248,153
1903	(3)14,402	37,291	74,158	429,822
1904	(3)13,064	32,025	71,999	286,698
1905	7,802	22,636	34,235	108,373
1906	(4)15,903	50,680	70,916	250,290
1907	(5)17,769	42,758	146,565	626,779
1908	(5)18,892	53,579	125,167	426,426
1909	(5)28,534	67,317	185,591	600,631
1910	(5)29,771	61,838	226,516	759,375
1911	(5)33,128	68,712	283,672	987,856
1912	6,769	12,478	237,094	799,910
1913	7,174	11,793	208,421	683,356
1914	8,189	13,156	220,126	760,257
1915	9,161	12,970	217,811	759,550
1916	11,615	18,683	247,802	909,176
1917	10,610	28,370	219,679	1,276,117
1918	14,005	48,572	162,626	1,191,077
1919	7,825	26,736	219,900	2,022,987
1920	8,474	35,707	220,903	2,122,223
1921	6,989	28,672	263,879	3,163,265
1922	9,679	37,331	347,697	3,938,769
1923	17,563	55,014	432,511	4,919,375
1924	19,332	56,186	477,845	5,563,913
1925	11,423	32,818	540,504	6,361,314
1926	13,082	38,788	509,522	5,758,433
1927	11,210	30,761	456,817	5,011,118
1928	12,359	30,211	378,664	3,775,584

(1) Data not available. (2) Includes Texas. (3) Includes California and Virginia. (4) Includes Utah production. (5) Includes Virginia.

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While the growth of the gypsum industry in Ohio has been steady, it does not show as great an increase in proportion to that in some of the other States. Between 1890 and 1900 the low point in production of crude gypsum reached 9,123 short tons, while the high point reached 27,205 tons. With the introduction of new products from calcined gypsum, larger demand by the cement industry for gypsum as a retarder, consolidation of some of the existing plants, and the entrance of the United States Gypsum Co. into the Ohio field, production immediately advanced, reaching 262,551 tons in 1912. Figures for Ohio alone prior to this date are not available, as the production of California and Virginia, or of Virginia alone are included (Table 2). Ohio reached its peak of production, 551,479 short tons, in 1925.

There are only three companies operating in Ohio at present, all of which are located in Ottawa County. The United States Gypsum Co. has a warehouse at Cleveland, where it stocks all products manufactured at Gypsum. Their plant at Gypsum includes mills for the manufacture of the usual gypsum products, but also has a mill for the manufacture of paper for use in plaster board and a sample plant for advertising purposes. Here also is made the new interior and exterior stuccos and accoustical plasters. The three plants are as follows:

United States Gypsum Co., Gypsum.
Certain-teed Products Co., Gypsum.
American Gypsum Co., Port Clinton.

Oklahoma

Oklahoma occupies a central position in a belt of deposits that extends more or less all the way from the northern part of Kansas into central Texas. The deposits were reported as being inexhaustible and of exceptionally pure grade, but nevertheless the industry started much later in Oklahoma than in neighboring States. The mining and manufacturing of gypsum was a well-organized industry in Kansas prior to 1900, and when several of the deposits at which plants were situated became exhausted, the operators moved on through Oklahoma, past some of the finest deposits in the United States, and located in Texas. At that time the deposits in western Oklahoma were without railroad facilities, but with the coming of better transportation in 1898 and 1899 four mills were constructed - The Rubey Stucco-Plaster Co.'s mill at the head of Salt Creek; 4 miles west of Ferguson, Okla., the American Cement Plaster Co.'s mill at Watonga; the Blackwell Cement Co.'s mill, 1½ miles southeast of Peckham, Kay County; and a mill at Cement in Caddo County, which later was owned by the Certain-teed Products Co. The last two companies used gypsite or gypsum earth.

Practically all the gypsum produced in Oklahoma during this period was used for the manufacture of gypsum plaster, and it was not until some years later that gypsum come into use as a fertilizer.

The actual production of gypsum did not begin in Oklahoma until 1894, when 1,300 tons were produced (see Table 2), but the amounts sold crude and as calcined material were not reported separately until 1903. In that year 699 short tons, valued at $879, was sold as crude gypsum, but no mention was made of how much of this was used as land plaster. It was not until 1910 that the use of gypsum as a fertilizer was reported, but no figures giving the amount used

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are available. The gypsum industry in Oklahoma has grown steadily since the advent of railroads, and in some years as many as 14 plants producing gypsum products have been in operation. At present, however, there are only four plants, operating in the State, and one producer of gypsum for use in the cement industry as follows:

Certain-teed Products Co., Acme, Grady County.
Do. Cement, Caddo County.
United States Gypsum Co., Eldorado, Jackson County.
Do. Southard, Blaine County.
Oklahoma Portland Cement Co., Primm, Blaine County.
(Gypsum miner only).

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Inf.Cir.No.6173. Table 9. - Sales of crude and calcined gypsum in Oklahoma, 1890 - 1927

	Crude		Calcined			Crude		Calcined	
	Short tons	Value	Short tons	Value		Short tons	Value	Short tons	Value
1890			-	-	1909	(3)15,942	$17,698	(3)258,338	$753,439
1891					1910	10,924	13,896	116,968	442,191
1892	(1)	(1)	(1)	(1)	1911	8,194	9,605	75,081	277,986
1893					1912	17,334	20,904	86,741	247,714
1894					1913	12,093	10,723	110,418	319,693
1895	(2)	(2)	(2)	(2)	1914	(4)	(4)	91,419	312,856
1896					1915	17,580	15,784	73,348	278,446
1897					1916	40,018	37,065	95,991	392,285
1898					1917	(4)	(4)	134,962	562,767
1899					1918	35,211	70,437	72,271	567,207
1900	- - -	- - -	18,437	$14,881	1919	24,761	63,920	72,013	644,740
1901	- - -	- - -	13,205	66,031	1920	Not available		69,924	772,749
1902	- - -	- - -	27,325	111,215	1921	72,087	238,494	99,923	1,046,844
1903	699	$879	57,049	233,742	1922	42,279	118,997	150,627	1,532,825
1904	2	5	43,209	190,240	1923	47,041	125,182	202,323	2,123,713
1905	(3) 1,548	1,993	(3)122,527	466,441	1924	64,980	157,748	201,762	2,442,333
1906	(3)24,197	94,899	(3)179,350	630,219	1925				
1907	(3)11,075	11,049	(3)223,254	813,569	1926				
1908	(3)14,362	16,721	(3)216,350	583,141	1927	(5)	(5)	(5)	(5)
					1928				

(1) No production. (2) Production of gypsum begun but not mentioned separately as sales of crude and calcined products until 1900. (3) Includes Texas. (4) Included in calcined gypsum sales. (5) Data not available.

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Oregon

Gypsum in commercial quantities occurs in two localities in Oregon, one at Gypsum, on Snake River, in Baker County and the other in Crook County. The deposit on Snake River has been known for about 40 years, but it was not until 1896 that a mill was built. The mill burned down in the same year, and another plant was then built just below the old one and operated for a time, but as the deposit did not prove satisfactory and costs of mining were high, the enterprise did not prove successful. The original company, the Oregon Lime and Plaster Co., sold its plant and holdings to the Acme Cement Plaster Co. of St. Louis, Mo., in 1911, and they in turn sold out to the Certain-teed Products Corporation of New York in 1923. Three years later the property was abandoned.

The Pacific Lime and Gypsum Co. of St. Louis, Mo., built a plant and started operations at Gypsum and sold out to the Acme Company, who turned their holdings over to the Certain-teed Company at the same time the Oregon Company was sold.

The Northwest Gypsum Co. of Huntington, Washington County, started operations near Huntington. The plant burned in 1908 and was never rebuilt.

There are no active producers in Oregon at present.

South Dakota

Important and fairly accessible beds of gypsum occur in the Black Hills of South Dakota. The gypsum ranges in thickness from a fraction of an inch to 30 feet.

Two thick beds of gypsum occur near Minnekahta, with several other beds 2 to 6 feet thick. Between Minnekahta and Hot Springs, gypsum outcrops as far east as Erskine on the Chicago, Burlington & Quincy Railroad.

Owing to their remoteness from market the gypsum deposits of the Black Hills have not been utilized to any great extent. A plaster mill at Hot Springs has been operated at times, and its very satisfactory product has found ready market, but as profits were being absorbed in freight charges, it has been forced to close down. Plaster of Paris has also been produced at Deadwood, Lead, and other towns of the northern Black Hills, but operators there have also been unable to compete in distant markets, and as their local markets are extremely limited, they were forced to close down. Other plants have been located at Whitewood, Erskine, Hot Springs, and Sturgis, but these likewise did not operate very long.

At present only two plants are in operation in South Dakota. A third deposit is still in the development stage, but actual operation is expected in the near future. One of these mills is at Piedmont, and is operated by the United States Gypsum Co. The mill which was started in 1908 at Rapid City, and had a capacity of about 150 tons of plaster a day, was burned in 1915. A new mill, erected at Piedmont, is in operation to-day, producing plaster and hollow building block and tile from rock gypsum and gypsite dug nearby.

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The other mill is located at Black Hawk, and is operated by the Dakota Plaster Co. A plant erected in 1910 was burned in the spring of 1916, but it was replaced at once by the present mill which started operations early in 1917. The Dakota Plaster Co. is a local company capitalized at $150,000 and capable of producing about 200 tons a day. In addition to making plaster, both for castings and common wall use, it has recently installed a tile machine and now manufactures block and tile.

In the Black Hills there are extensive deposits of high-grade gypsum which can be worked cheaply, so that the industry may be further developed as the population of the Northwest increases and more favorable freight rates can be worked out.

Texas

The occurrence in Texas of gypsum deposits of great extent has long been known through the reports of early exploring parties, but it was not until 1892 that production of this mineral was first reported. In May, 1891, the Lone Star Products Co., of Quanah, Tex., was organized with a capital of $100,000 and constructed a plant at Acme near Quanah, at the gypsum deposits in the northern part of the State near the Red River. Operations were begun in April, 1892, with a mill capacity of 75 tons of plaster a day. During that year, 1,926 short tons of plaster was produced and sold. Several years later a second plant was put into operation in the same locality.

Practically the entire output from these plants was in the form of wall plaster, and it was not until about 1906 that other gypsum products came into prominence in this region.

By 1910 Texas had become an important producer of gypsum products, and the three plants then in operation, two at Acme and one at Hamlin, produced the bulk of the wall plaster used in Texas. One of these plants was also manufacturing Keene's cement. In 1911 another plant started operations at Acme, and manufactured various plasters, such as plaster of Paris, molding and casting plaster, hard wall plaster, flooring plaster, and hard-finish plaster. It was during the next three years that a readjustment of the industry took place throughout the United States, during this period several old mills were replaced by newer ones and a number of plants were established at commercial centers remote from deposits, at which ingredients were assembled for the manufacture of finished products. This readjustment had its effect in Texas, but along different lines. It was at this time that producers in Texas were seeking markets for their finished products outside the State, especially the Gulf States eastward to Florida.

During this readjustment period about 80 per cent of the crude gypsum sold was used in the cement mills of Texas; one company sold considerable quantities for this purpose. The five plants in operation in Texas during 1918 were owned by three companies, the Texas Cement Plaster Co., at Plasterco, Fisher County; the American Cement Plaster Co., at Acme; and the Acme Cement Plaster Co., also at Acme, in Hardeman County. This latter company also made Keene's cement.

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In recent years there have been four plants and one quarry in operation in Texas, as follows:

Universal Gypsum & Lime Co., Rotan.
United States Gypsum Co., Sweetwater.
Texas Cement Plaster Co., Plasterco.
Certain-teed Products Co., Acme.
Texas Cement Plaster Co.,4/ Longworth.

The following table shows the sales of crude and calcined gypsum in Texas for the years 1890 to 1928:

4/ Ships its crude rock to the Texas Cement Plaster Co., at Plasterco.

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Table 10. - Sales of crude and calcined gypsum in Texas, 1890-1928

Year	Crude		Calcined		Year	Crude		Calcined	
	Short tons	Value	Short tons	Value		Short tons	Value	Short tons	Value
1890					1909	(5)40,110	$47,134	78,546	$274,787
1891					1910	(5)45,610	57,194	75,445	320,028
1892	(1)	(1)	(1)	(1)	1911	(6)	(6)	143,281	491,685
1893					1912	(6)	(6)	131,033	356,579
1894	- - -	- - -	4,750	$ 27,300	1913	(6)	(6)	133,946	345,749
1895	- - -	- - -	7,166	36,511	1914	(6)	(6)	133,478	490,937
1896	(1)	(1)	(1)	(1)	1915	(6)	(6)	148,138	519,879
1897	- - -	- - -	16,412	65,651	1916	(6)	(6)	163,444	635,288
1898	(1)	(1)	(1)	(1)	1917	(6)	(6)	220,983	996,262
1899	(1)	(1)	(1)	(1)	1918	(6)	(6)	129,034	834,560
1900	(2) 3,450	$ 4,805	(2)233,120	899,458	1919	(7)10,637	16,442	130,642	1,064,264
1901	(2) 5,829	8,600	(2)164,720	620,736	1920	(7)16,900	47,961	164,956	1,391,382
1902	(2) 5,288	7,677	(2)232,385	799,678	1921	(7)10,709	33,068	183,159	1,732,463
1903	(2)12,184	21,103	(2)244,072	1,065,942	1922	(8)	(8)	242,268	2,030,688
1904	(3) 9,709	14,217	(3)132,851	533,143	1923	(8)	(8)	254,512	2,177,983
1905	(4) 1,548	1,993	(4)122,527	466,441	1924	(8)	(8)	301,512	2,566,736
1906	(4)24,197	94,899	(4)179,350	630,219	1925				
1907	(4)11,075	11,049	(4)223,254	813,568	1926	(1)	(1)	(1)	(1)
1908	(4)14,362	16,721	(4)216,350	583,141	1927				
					1928				

(1) Data not available. (2) Includes Kansas and Iowa. (3) Includes Kansas. (4) Includes Oklahoma. (5) Includes Oklahoma and Kansas. (6) Crude included with calcined. (7) Agricultural gypsum included in figure for "Other States." (8) Crude figures included with "Other States."

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Utah

Commercial deposits of gypsum are abundant and widespread in central and southern Utah. Plaster mills have been operated at Nephi, Levan, and Sigurd, and plaster has been made by crude methods for local consumption at St. George and other places.

The gypsum deposit at Nephi is at the mouth of the canyon of Salt Creek, 2 miles east of the railroad station. It was discovered many years ago, before the town of Nephi was settled. A claim 600 by 1,500 feet was patented by John Hague and others in 1882 under the name of Juab Plaster and Mining Claim. During the next few years rock gypsum was quarried and calcined in sorghum pans, and the plaster was used locally or shipped to Salt Lake City. In 1888 Messrs. Hyde, Hague, and Whitmore incorporated their company and erected a mill. Operations are still carried on under the name of Nephi Plaster and Manufacturing Co. The rock at this deposit is 250 feet wide in the lower workings but widens above to 300 feet or more. Formerly the rock was taken out by quarrying, but as the quarry face became dangerously high, a combination of quarrying, glory-holing, and underground mining is now in use. The gypsum at the top of the quarry is blasted down into a glory hole and drawn out below by a tunnel that lies wholly in gypsum. The rock is loaded in small steel mine cars, which are pushed by hand to the loading house at the top of a steeply inclined gravity tram. In descending to the mill 400 feet below, the loaded tram car, which carries the contents of three or four mine cars, pulls up the empty car. The load is dumped automatically into a storage bin at the mill. The present mill is of modern concrete and steel construction, made fire resistant with partitions of metal lath and gypsum plaster.

There is at present only one operator at Sigurd, Sevier County, Utah, the Jumbo Plaster & Cement Co. This plant first operated in 1909, and manufactures plaster of Paris and wall plasters. The rock is quarried 2 miles northeast of the mill and is hauled in wagons. The other producer, the American Keene's Cement Co., which has been in operation for a number of years at Sigurd, closed down a few years ago, and their plaster mill was taken over by the Jumbo Plaster & Cement Co.

The plant of the American Cement and Plaster Co. at Sigurd, which has been idle since 1924, was first known as the Utah National Products Co. This company sold out to the American Gypsum Co. early in 1922, and in September of the same year was sold to the American Cement and Plaster Co.

At Cedar City, in Iron County, the Mammoth Plaster and Cement Co. started operations in the latter part of 1923, but closed down after operating only a year. They furnished cement plants with rock gypsum for use as a retarder.

Virginia

All the workable gypsum deposits of Virginia occur in Washington and Smyth Counties, in the valley of the North Fork of Holston River. The material occurs as rock gypsum, and because of its remarkable purity compares favorably with that from Nova Scotia.

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The development of the gypsum industry in this area has been governed almost entirely by transportation facilities. The deposits in the upper valley, though extensive and easily workable, have not been exploited to any great extent, as there is no transportation other than by road. The deposits at Saltville and Plasterco have furnished the principal output in the past.

Prior to 1902 the deposits south of Saltville at Plasterco were the most extensive and were worked by the Buena Vista Plaster Co. The gypsum was ground for land plaster or shipped to Glade Springs, where it was used in the manufacture of Keene's cement. In May, 1909, the Buena Vista Plaster Co., was taken over by the United States Gypsum Co., and to-day they operate the deepest gypsum mine in the United States. They manufacture practically all gypsum products, and because of the fact that Virginia has the only gypsum deposits of commercial and economic importance in the Southeastern States, their market covers this entire area.

In 1905 D. J. and E. W. Buchanan constructed a mill at Chatham Hill in Smyth Co., but they discontinued operations in 1908.

In 1906 the Southern Gypsum Co. opened up a mine and erected a products plant at Plasterburg, or what is now called North Holston, several miles to the northeast of Saltville, and in 1907 reported their first production. In January 1927, this plant was taken over by the Beaver Products Co., and a year later was sold to the Certain-teed Products Co. of New York, but is still operated under the name of the Beaver Products Co., Inc., of Virginia.

These plants are the only two in operation in Virginia, and their products are well known throughout the Southeastern States.

Wyoming

Wyoming has a number of gypsum deposits varying in composition from pure crystal to earthy gypsum, or gypsite.

Gypsum was first developed in Wyoming about 1889, when at Red Buttes, on the Union Pacific Railroad, 9 miles south of Laramie, Albany County, a small plant was erected for the manufacture of plaster of Paris and wall plaster under the name of Red Buttes Cement & Plaster Co. In 1897 this plant and quarry were taken over by the Consolidated Plaster Co. After passing through several hands the plant in 1917 finally became the property of the Colorado Portland Cement Co. who operated it until 1923 and then closed it down. The quarry was located near the mill; a pure, almost white deposit of rock gypsum covered by a very thin overburden was worked to a depth of 15 feet. This depth, however, is not the entire thickness of the deposit.

Just south of the town of Laramie a very large bed of gypsite, or secondary gypsum, was discovered about 1895. This deposit of 180 acres was first worked by the Standard Cement Plaster Co., but the plant was later taken over by the Acme Cement Plaster Co., of St. Louis, Mo. The original plant was erected in 1896. In April, 1923, the Certain-teed Products Corporation took over this plant which is in full operation to-day. The deposit is covered with about a foot of soil which when removed by means of plows and scrapers

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exposes an accumulation of gypsite that is free from extraneous matter and is about 9 feet deep. The material is plowed, taken up in wheeled scrapers, and hauled to the mill.

At Basin, Bighorn County, a small mill began operation about 1917, using rock gypsum quarried on the Chicago, Burlington, & Quincy Railroad, 8 miles north of Greybull. A large part of the plaster made at Basin was molded into building blocks for exterior use. The appearance of buildings made from these blocks was pleasing, and because of the semiarid climate the weather seems to have had no bad effect on them. The plant while in operation served only the local market.

In 1920 this company, the basin Cement Plaster Co., was taken over by the Wyoming Cement Plaster Co., and again in 1926 the plant was purchased by Walter Brothers, of Hyattsville, Wyo. This plant has been shut down during the past two years.

In 1927 the Laramie Cement Plaster Co. started operations just south of Laramie. This plant was built to manufacture cement plasters and used gypsite. The company controlled 160 acres, of which 55 acres contained excellent gypsite ranging from 11 to 18 feet in thickness. The deposit was about 1 mile from the plant. This company has not been operating since 1924.

The following table lists the active producers of gypsum in the United States in 1928.

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Manufacturers of Gypsum products in the United States 1928.

Company	Location of mine or plant	Products manufactured
American Gypsum Co., Port Clinton, Ohio.	Port Clinton, Ottawa Co., Ohio.	Plasters, plaster board, plaster of Paris.
American Keene Cement Co., Salt Lake City, Utah.	Sigurd, Sevier Co., Utah.	Keene's cement
Arizona Gypsum Plaster Co., Douglas, Arizona.	Douglas, Ariz.	Plasters, block and tile
Beaver Products Co. of Virginia, 100- E. 42nd St., New York City.	North Holston, Va.	Plasters, wall board, block and tile, plaster of Paris, Keene's cement.
Best Bros. Keene's Cement Co., Medicine Lodge, Kans.	Sun City, Barber Co., Kansas.	Plaster of Paris, Keene's cement
Blue Diamond Co., 1650 S. Alameda St., Los Angeles, Calif.	Arden, Clark Co., Nev.	Plasters
Cardiff Gypsum Plaster Co., 903 Central Avenue, Fort Dodge, Iowa.	Gypsum, Webster Co., Iowa.	Plasters
Certain-teed Products Corporation, 100 E. 42nd St., New York City.	Fort Dodge, Webster Co., Iowa.	Plasters, wall board, block and tile, plaster of Paris, Keene's cement.
Do.	Blue Rapids, Kans.	Plasters, wall board, plaster of Paris, Keene's cement.
Do.	Grand Rapids, Mich.	Plasters, wall board, block and tile, plaster of Paris, Keene's cement.
Do.	Acme, Chaves County, N. Mex.	Plasters, plaster and wall board, tile, plaster of Paris, Keene's cement

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Company	Location of mine or plant	Products manufactured
Certain-teed Products Corporation, 100 E. 42nd Street, New York City.	Akron, N. Y.	Plasters, wall board, block and tile, plaster of Paris, Keene's cement.
Do.	Gypsum, Ohio	Plasters, wall board, plaster of Paris, Keene's cement
Do.	Acme, Grady Co., Okla.	Plasters, plaster and wall board, plaster of Paris, Keene's cement.
Do.	Acme, Tex.	Plasters, wall board, block and tile, plaster of Paris, Keene's cement
Do.	Laramie, Albany Co., Wyo.	Plasters, wall board, plaster of Paris, Keene's cement
Colorado Portland Cement Co., Portland, Colo.	Coaldale, Fremont Co., Colo.	Plasters
Dakota Plaster Co., Rapid City, S. Dak.	Black Hawk, Meade Co., S. Dak.	Plasters, wall board.
Ebsary Gypsum Co., Inc., Scottsville, N. Y.	Scottsville, N. Y.	Plasters, wall board, block and tile.
Empire Gypsum Co., Inc., 319 Cutler Bldg., Rochester, N. Y.	Garbutt, Monroe Co., N. Y.	Plasters, block and tile.
Federal Gypsum Co., 418 Valley Nat'l Bank Building, Des Moines, Iowa.	Centerville, Appanoose County, Iowa.	Plasters, block and tile, Plaster of Paris
Grand Rapids Plaster Co., 1204 Grand Rapids Savings Bank Building, Grand Rapids, Mich.	Grand Rapids and Grandville, Kent County, Mich.	Plasters

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Company	Location of mine or plant	Products manufactured
Jumbo Plaster & Cement Co., Sigurd, Utah.	Sigurd, Sevier Co., Utah.	Plasters
Michigan Gypsum Co., Plaster Dept., Grand Rapids, Mich.	Grand Rapids, Kent Co., Mich.	Plasters
National Gypsum Co., 409 Jackson Bldg., Buffalo, N. Y.	National City, Iosco County, Mich.	Plasters, wall board, plaster of Paris.
Do.	Clarence Center, Erie County, N. Y.	Plasters, wall board, plaster of Paris.
Nephi Plaster & Mfg. Co., 907 Continental Bank Building, Salt Lake City, Utah.	Nephi (near), Juab Co., Utah.	Plasters, plaster of Paris, Keene's cement.
Niagara Gypsum Co., 597 Michigan St., Buffalo, N. Y.	Oakfield, Genesee Co., N. Y.	Plasters, plaster and wall board, block and tile
Oakfield Gypsum Products Corporation, Oakfield, N. Y.	Alabama, Genesee Co., N. Y.	Plasters
Pacific Portland Cement Co., Consolidated, 111 Sutter St., San Francisco, Calif.	Plaster City, Imperial County, Calif.	Plasters, block and tile, Plaster of Paris.
Do.	Empire, Near Gerlach, Washoe Co., Nev.	Plasters, block and tile, plaster of Paris.
Three Forks Portland Cement Co., (Colorado Portland Cement Co.) 507 Ideal Building, Denver, Colo.	Hanover, Fergus County, Mont.	Plasters.
Standard Gypsum Co., Lessee, Nevada Douglas Consolidated Copper Co., Prop., 1112 Phelan Building, San Francisco, Calif.	Ludwig, Lyon Co., Nev.	Plasters

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Company	Location of mine or plant	Products manufactured
Texas Cement Plaster Co., 701-715 Petroleum Bldg., Oklahoma City, Okla.	Hamlin, Fisher Co., Tex.	Plasters, wall board, block and tile, plaster of Paris.
United States Gypsum Co., 300 West Adams St., Chicago, Ill.	Midland, Riverside Co., Calif.	Plasters, plaster and wall board
Do.	Loveland, Larimer Co., Colo.	Plasters, plaster and wall board
Do.	Fort Dodge, Webster Co., Iowa.	Plasters, plaster and wall board, block and tile.
Do.	Blue Rapids, Marshall County, Kans.	Plasters
Do.	Alabaster, Iasco Co., Mich.	Plasters
Do.	Grand Rapids, Kent Co., Mich.	Plasters
Do.	Heath, Fergus Co., Mont.	Plasters, block and tile.
Do.	Arden, Clark Co., Nev.	Plasters, block and tile.
Do.	Gypsum, Ottawa Co., Ohio.	Plasters, plaster and wall board, block and tile.
Do.	Eldorado, Jackson Co., Okla.	Plasters, plaster and wall board.
Do.	Southard, Blaine Co., Okla.	Plasters, plaster and wall board, Keene's cement
Do.	Oakfield, Genesee, N. Y.	Plasters, plaster and wall board, block and tile.
Do.	Piedmont, Meade Co., S. Dak.	Plasters
Do.	Sweetwater, Nolan Co., Tex.	Plasters, plaster and wall board.
Do.	Plasterco, Washington Co., Va.	Plasters, plaster and wall board.

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Company	Location of mine or plant	Products manufactured.
United States Gypsum Co., 300 West Adams St., Chicago, Ill.	Laramie, Albany Co., Wyo.	Plasters, plaster and wall board.
Universal Gypsum & Lime Co., 1533 Conway Building, Chicago, Ill.	Fort Dodge, Webster Co., Iowa.	Plasters, plaster and wall board, block and tile.
Do.	Akron, N. Y.	Plasters, plaster and wall board.
Do.	Rotan, Fisher Co., Tex.	Plasters, plaster and wall board.
Wasem Plaster County, Warden Apartments, Ft. Dodge, Iowa.	Fort Dodge, Webster Co., Iowa.	Plasters, block and tile, plaster of Paris.
Atlas Gypsum Corporation, 25 Broadway, New York City.	Mine: Clarence Center, Erie Co., N.Y.	
Atlas Portland Cement Co. of Kansas, Independence, Kans.	Mine: Watonga, Blaine County, Okla.	
Hawkeye Gypsum Products Co., Fort Dodge, Iowa.	Mine: Fort Dodge, Iowa.	
Lycoming Calcining Co., 120 W. 4th St., Williamsport, Pa.	Mine: Garbutt, Monroe County, N. Y.	
Phoenix Gypsum Co., Inc., Basom, N. Y.	Mine: Alabama, Genesee County, N. Y.	
Regan Brothers, Mason, Nev.	Mine: Mason, Lyon Co., Nev.	

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CRUDE GYPSUM IMPORTERS

Company	Location of mine or plant	Products manufactured.
Atlantic Gypsum Prod. Co., 40 Central Street, Boston, Mass.	Mine: Ingonish, N. S. Plant: Chester, Pa.	Plasters, block and tile, plaster of Paris.
Do.	Mine: Cheticamp, N. S. Plant: New York, N. Y.	Plasters, plaster of Paris.
Do.	Mine: Cheticamp, N. S. Plant: Portsmouth, N. H.	Plasters, plaster and wall board, block and tile, plaster of Paris.
Connecticut Adamant Plaster Co., New Haven, Conn.	Mine: Chevérie, Hants County, N. S. Plant: New Haven, Conn.	Plasters, plaster of Paris.
Newark Plaster Co., 30 Church St., New York, N. Y.	Mine: Ottawa Brook, N.S. Plant: Newark, N. J.	Block and tile, plaster of Paris.
Chas. W. Priddy & Co., Norfolk, Va.	Mine: Walton, N. S. Plant: Norfolk, Va.	Land plaster.
Rutland Fire Clay Co., Rutland, Vt.	Mine: Baddeck, N. S. Plant: Rutland, Vt.	Plasters.
Standard Gypsum Co., 1112 Phelan Building, San Francisco, Calif.	Mine: San Marcos Island, Lower Calif., Mex. Plant: Long Beach, Los Angeles Co., Calif.	Plasters, plaster and wall board, plaster of Paris.
Do.	Mine: San Marcos Island, Lower Calif., Mex. Plant: Seattle, Wash.	Plasters, plaster and wall board, plaster of Paris.
United States Gypsum Co., 300 West Adams St., Chicago, Ill.	Mine: Windsor, N. S. Plant: New Brighton, N. Y.	Plasters, plaster and wall board.
Universal Lime & Gypsum Co., Chicago, Ill.	Mine: Windsor, N. S. Plant: Newburgh, N. Y.	Plasters, plaster of Paris.

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